

Applicants : Jei-Fu Shaw  
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Filed : February 19, 2004  
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Attorney Docket No.: 70002-104001  
Client Ref. No.: 09A-911128

#### REMARKS

The present document is submitted in reply to the Office Action dated December 28, 2009 ("Office Action").

Applicants have amended claim 14 to more particularly point out the subject matter they deem as their invention. Support for the amendment can be found in the specification at page 3, lines 24-25. This amendment has necessitated revisions to claims 15, 45, and 54. No new matter has been introduced.

Claims 14-16, 18-20, 31-36, 45, 47, 48, and 53-56 are currently pending and under examination. Note that claims 1-13, 17, 21-30, 37-44, 46, and 49-52 were previously cancelled.

Applicants respectfully request that the Examiner reconsider this application in view of the following remarks.

#### Rejection under 35 U.S.C. § 112, First Paragraph (Enablement)

Claims 14-16, 18-20, 31-36, 45, 47, 48, and 53-56 are rejected for lack of enablement. See the Office Action, pages 2-3. More specifically, the Examiner states that the specification, "while being enabling for those starch hydrolyzing enzyme that hydrolyzes starch to oligosaccharide stable at the temperature coagulating proteins (e.g., a thermostable  $\alpha$ -amylase), does not reasonably provide enablement for those not stable at the temperature coagulating proteins." See the Office Action, pages 2-3, bridging paragraph.

Applicants have amended claim 14, the only independent claim, to specify that the first starch hydrolyzing enzyme recited therein (for degrading starch to oligosaccharide) is a thermal stable  $\alpha$ -amylase. This amendment has rendered moot the Examiner's ground for rejection.

#### Rejection under 35 U.S.C. § 103

Claims 14-16, 18-20, 31-36, and 45-50 are rejected for obviousness over Shaw et al., ("Shaw") in view of Seidman et al. ("Seidman"), Jones et al. ("Jones"), Nutrient Facts

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on Glutinous Rice ("Nutrient Facts"), and Skory et al. ("Skory"). See the Office Action, pages 3-7.

Claim 14 will be discussed first. This claim, as amended, is drawn to a method for producing a fermentation product. The claimed method includes (i) a dual-enzyme treatment process to obtain a glucose-rich syrup, with proteins removed, and (ii) a culturing process to grow a microorganism in this glucose-rich syrup as is.

The relevant teachings in the four cited references, as pointed out by the Examiner, are summarized below:

-- Shaw teaches a method of converting milled rice to a high-maltose syrup (see the Office Action, page 4, second paragraph),

-- Seidman teaches liquefying starch with a thermal stable  $\alpha$ -amylase and subsequently a glucoamylase to produce a glucose-rich syrup (see the Office Action, page 5, third paragraph),

-- Jones teaches that two rice globulin proteins coagulate at 74-90 °C (see the Office Action, page 4, fourth paragraph),

-- Nutrient Facts lists major nutrient elements of rice (see the Office Action, page 6, first paragraph), and

-- Skory teaches a fermentation process by culturing *Aspergillus oryzae* in a glucose-containing medium to produce ethanol (see the Office Action, page 6, third paragraph).

In view of the above teachings, the Examiner proceeds to conclude that the method of claim 14 is obvious over the cited references. More specifically, he asserts that it would have been obvious, in view of Jones, Nutrients Facts, and Skory, to use a glucose-rich syrup (derived from modifying the Shaw method in view of Seidman) as is to grow a microorganism, thereby arriving at the claimed method.

Applicants submit herein a declaration of co-inventor Dr. Guan-Chiun Lee ("Declaration") to present evidence showing that, contrary to the Examiner's belief, a skilled person in the art would not have been motivated to use a sugar-rich syrup prepared by the method disclosed in Shaw, as is, to grow a microorganism.

The Declaration points out that the Shaw method produces a sugar-rich syrup from rice with protein removed. It also points out that protein is the major nitrogen-containing nutrients in rice and that other nitrogen-containing nutrients, i.e., B vitamins, are scarce in rice, i.e., around **0.02%** by weight. See page 2, third paragraph. Clearly, this sugar-rich syrup, with protein removed, is deficient in nitrogen-containing nutrients. As a microorganism needs a sufficient nitrogen source to grow, a skilled artisan would have readily known that, without addition of other nutrients, the sugar-rich syrup prepared by the Shaw method would not be a suitable medium for growing a microorganism. For this reason, the Declaration concludes that a skilled artisan would not have been motivated to use the sugar-rich syrup produced by the Shaw method as is to grow a microorganism, a requirement of the method covered by claim 14.

None of the relevant teachings in Seidman, Jones, Nutrient Facts, and Skory relate to culturing a microorganism in a sugar-rich syrup from rice with protein removed. Thus, they do not cure the deficiency of Shaw.

In view of the foregoing reasons, Applicants submit that claim 14 is not obvious over Shaw in view of Seidman, Jones, Nutrient Facts, and Skory. Nor are claims 15, 16, 18-20, 31-36, and 45-50, all dependent from claim 14.

For a complete record, Applicants address below the Examiner's two grounds in support of the rejection.

First, the Examiner asserts that "it is well known in the art that glucose derived from rice is a source for fermenting rice with yeast or any other ethanologenic microorganisms (e.g., filamentous fungi) ..." See the Office Action, pages 5-6, bridging sentence. Note that, to prepare rice wine, it is routine practice to mix an ethanologenic microorganism with whole rice for fermentation and then remove insoluble materials (e.g., denatured proteins) after fermentation. Clearly, the common knowledge relied on by the Examiner does not suggest growing any microorganism in a sugar-rich syrup from rice with protein removed. Thus, the Examiner's reliance on it is misplaced.

Second, the Examiner asserts that the B vitamins in rice can serve as a nitrogen source for microorganisms. See the Office Action, page 6, first paragraph. As pointed

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out in the Declaration, the total amount of B vitamins in rice is very low, i.e., about 0.02% by weight. See page 2, second and third paragraphs. The Declaration further points out that B vitamins are commonly known as a poorer nitrogen source than amino acids/peptides for microorganism growth. See page 2, third paragraph. As such, a skilled artisan would readily know that B vitamins in rice do not provide sufficient nitrogen to support microbial growth, as mistakenly believed by the Examiner.

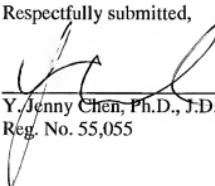
#### CONCLUSION

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

The Petition for Extension of Time fee in the amount of \$ 490 is being paid concurrently herewith on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other charges to Deposit Account No. 50-4189, referencing Attorney Docket No. 70002-104001.

Respectfully submitted,

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